of the urine of carnivora. Acquainted with this fact, Magendie kept fasting for three days the rabbit into whose veins he was going to inject the starch. At the time of the experiment its urine was in consequence acid, limpid, and loaded with urea. When examined a few moments after the injection, it was highly interesting to observe that it had undergone a complete change, having resumed in this short time the character common to the healthy urine of rabbit,—being alkaline, turbid, and containing no perceptible quantity of urea. This result, which was several times verified on rabbits and horses, is one of considerable interest, and tends to prove still more clearly the close connection which evidently exists between the composition of the blood and that of the urine.

The introduction of starch into the blood by means of injection, being, however, an unnatural proceeding, it became desirable to ascertain whether, when taken into the circulation during the ordinary process of digestion, starch undergoes conversion into sugar. To determine this point, a dog was fed for several days exclusively on cooked potatoes, mixed with a small quantity of lard. As soon as its urine became turbid, alkaline, and devoid of urea, some blood was drawn and examined. It was found to possess a notable proportion of glucose, and a quantity of another principle, soluble in water, insoluble in alcohol, and presenting the other characters of dextrine. The urine of this dog, however, contained no sugar; a fact which is important in relation to the etiology of diabetes, inasmuch as it shows that sugar may exist in the blood, yet without being found in the urine. This circumstance was noticed by MM. Bernard and Barreswil on introducing glucose directly into the circulation: the same observers found, however, that when cane-sugar was introduced into the veins, it very shortly appeared in the urine. In the blood of horses fed exclusively on oats, Magendie found both dextrine and sugar, although the urine was acid, clear, and contained urea. He has not yet made the experiment on man, but he considers it tolerably certain that during the digestion of amylaceous principles of food, sugar will be naturally present in human blood. There is reason, therefore, to suppose, that, although found in the blood of diabetic patients, it may also occur in the blood of perfectly healthy persons, as a natural consequence of the digestion and absorption of starch.* The following experiment may serve to show how the applications of chemistry to physiology may still further throw light on some of the mysteries of the blood. If into the veins of an herbivorous animal whose urine is alkaline, turbid, and almost devoid of urea, a certain quantity of recently prepared meat-broth be injected, the urine will in a very few moments assume the character peculiar to the urine of animals feeding on animal food: that is to say, it will become limpid, acid, and loaded with urea. May one not conclude from such an experiment, that the presence of urea in the urine is dependent on the composition of the blood, and that the origin of this substance is not always the one usually attributed to it?—*Comptes Rendus*, 27th July, 1846.

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4. *Character of the Blood in Malignant Affections of the Uterus.*—It has long been a matter of uncertainty whether in cancerous disease the blood undergoes a peculiar and constant change in its composition or its quality. The subject is one of considerable importance, and has latterly engaged the attention of Heller, who has examined carefully both the chemical composition and the microscopical characters of this fluid, in persons affected with carcinomatous diseases. It has been recently stated by Engel that the blood in cancer undergoes a pathological change

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* To prove that the digestion of starch may occur quite independently of being acted on by the pancreatic fluid, Magendie had the pancreatic ducts in a pigeon destroyed, and after six weeks had the bird killed in such a way that its blood was all preserved. Previous to its death it was fed on grain, and was in good condition. The blood was found to contain a notable quantity of sugar. The pancreas was in great measure atrophied, and its ducts did not communicate with the intestine. This result seems singular, for one would suppose that a bird deprived of its salivary glands and pancreas would not be able to digest starch; it is proved, however, by the above experiments that bile also acts upon starch, and that when absorbed and carried into the circulation it soon becomes transformed.

which consists chiefly in the development of an excessive quantity of albumen, whilst in tuberculous diseases the fibrine is the element which is in excess both in the blood and in the morbid material poured out. This statement, however, is in the opinion of Heller merely hypothetical, and is based on evidence furnished by no direct chemical analysis, which alone can determine the question. Heller therefore took advantage of several cases of malignant affection of the uterus and vagina, which fell under his notice, and he examined carefully the blood passed by flooding, as also portions drawn directly from the arm. Omitting the particulars of the various cases, the general results only to which his researches led him need be here stated.

His microscopical examination of the blood proved the following chief points: 1st. That the blood corpuscles in cancerous disease always present a great variety in their size, some of them being smaller than natural, and others considerably above the average size; some are even three times larger than ordinary. The smaller ones are usually finely indented, granulated, or mulberry-like; the larger ones invariably smooth. This variety in size of the blood corpuscles, though always present in the blood in cancerous disease, is not peculiar to this kind of blood, for it also occurs in blood which contains pus. 2. That when blood is examined according to the method employed for the detection of pus in it, peculiar cells may be found in it, which correspond in form and other peculiarities to the ordinary cells of cancer. This is a fact which had not been hitherto made out, but about which there is now no doubt. 3. That in addition to the above peculiarities, there are observed by the microscope minute bodies of a more or less crystaline form, and possessed of a bright golden-yellow metallic lustre, which are most distinctly seen on darkening the field of the microscope. When viewed by transmitted light they appear in part colourless or yellowish, and in part of a bluish tint, showing a play of colours. These peculiar glittering particles may in most cases be distinguished with the naked eye after the blood has coagulated, appearing either as golden pellicles in the clot, or as glittering particles floating in the serum.

The chemical analysis of the blood furnished results equally decided in their nature. In the first place there was observed a constant, absolute, and relative increase in the quantity of *fibrine*, both in the hemorrhagic blood as well as in that withdrawn by venesection. The quantity of fibrine varied, and this variety was most marked in the metrorrhagic blood; sometimes in this latter the quantity amounted to as much as 13·42 parts in 1000: in one case even to 16·44 parts. In the blood drawn from a vein the quantity was always above natural, yet seldom greatly exceeded three parts in 1000. On comparing the quantity of fibrine in the blood discharged by hemorrhage from the uterus with that in the blood drawn by venesection, it would seem as if nature was endeavoring to get rid of a portion of excessively fibrinated blood by a spontaneous discharge from the uterus of blood loaded with fibrine. The *albumen* was present in its normal quantity, or if anything rather below it, so that there are no grounds for regarding the cancerous diathesis as an albuminous one, or for considering the cancerous material as composed of albumen. The quantity of *blood corpuscles* was always very small, both in the hemorrhagic blood as well as in that drawn from a vein. Sometimes the diminution of corpuscles was so great that complete anæmia of the body was found after death.

The view, therefore, that the cancerous diathesis is an albuminous one, and therefore opposed to the tuberculous diathesis, which is a fibrinous one, is completely erroneous, for the quantity of fibrine in the blood in cancerous affections is always in excess, and the diathesis therefore in such cases should be regarded as a fibrinous one, just as it is in tuberculous disease, where also an excess of fibrine (together with a diminution of red corpuscles), prevails in the blood.

This is another argument against the view of antagonism, which has been stated, though without good foundation, to exist between the cancerous and tuberculous diathesis.—*Lond. Med. Gaz.*, from *Heller's Archiv.*, 1846.

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5. *Analysis of the Urine, Blood, Fæces and Vomited Matters in Cholera Sporadica.* By Dr. Heller.—A case of sporadic cholera, which proved fatal, having come